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AUTHOR Hagedorn, Victoria S.
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ABSTRACT

A hierarchy of auditory processing developed by Derek Sanders for use in developing sequential objectives for musical listening skills serves as the basis for this article. Because of the similarities between components of speech and music, the hierarchy is congruent with musical listening expectations. While this model was designed for the development of speech discrimination, it has important implications for music education. The hierarchy consists of a 10 level sequence for processing auditory stimuli. The steps consist of: (1) awareness of the stimuli; (2) localization; (3) attention; (4) discrimination between speech and nonspeech sound; (5) auditory discrimination; (6) suprasegmental discrimination; (7) segmental discrimination; (8) auditory memory; (9) auditory sequential memory; and (10) auditory synthesis. Use of this hierarchy for advancing listening experiences for hearing impaired children could be used to maximize the residual hearing on musical listening. A brief look at each of these levels and the suggested correlation between the hierarchy and music is included. While deaf children may require more attention from the music teacher, and materials may have to be adapted in their presentation, musical perception is a possibility. With a little imagination and the adaptation of materials used in the musical education of hearing children, activities for the deaf can be designed to enhance the development of the perceptive skills in the described hierarchy. To build an effective music program for the deaf, it is necessary to create a foundation of musical perception in the early years of the child's music education. Contains 15 references and an appendix of resources for musical examples. (DK)

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Musical Learning for Hearing Impaired Children

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Musical Learning for Hearing Impaired Children

By Victoria S. Hagedorn, University of South Florida-Tampa

Since the implementation of P.L. 94-142, more and more children with hearing impairments are attending music classes in the general public school setting. Some children will be mainstreamed with their hearing peers while others will receive music classes with hearing impaired peers. Those hearing impaired children receiving music in a self-contained setting will probably be classified as having a severe to profound hearing loss. It has been found that hearing impaired children along with behavior/emotionally handicapped children are considered to be the most difficult student to mainstream in music classes (Darrow & Gfeller, 1991; Gfeller, Darrow & Hedden, 1987).

The first school for the deaf in the United States was established in 1817 in Hartford, CT., and first incorporated the use of music with the deaf in 1848. Edwards (1974) gave a comprehensive description of past uses of music with the deaf in America from 1848 to the early 1970's and found that the ends or goals for uses of music with the deaf fluctuated and that "... the pendulum swings from an emphasis on music to an emphasis on speech, and then back to music again. Today a variety of purposes are served by music, including therapeutic, linguistic, social, psychological, and musical" (p. 3).

With the presentation of a music program for deaf individuals based on musical goals, Edwards placed emphasis on music education for these children. As a result of her book, Music Education for the Deaf, in which the philosophy goals and objectives of a music program are outlined, Edwards has started a resurgence of music education based on musical ends for the deaf. Since publication of her book, several music programs based on music education have been instituted, most notably at the New York State School for the Deaf (NYSSD), a residential school for the deaf. The music program developed by the Robbins for NYSSD has been a success and has resulted in publication of Music for the Hearing Impaired and other Special Groups: A Resource Manual and Curriculum Guide (1980). Another residential school, the Western Pennsylvania School for the Deaf (WPSD), has developed a music program based on the five strands of sound, rhythm, movement, songs and percussion (Schatz, 1989). These strands are outlined in a comprehensive scope and sequence chart and have also been published.

While these programs have been found to be effective in the residential setting, few music programs for the hearing impaired exist at the local level. Darrow (1990) has reviewed the current literature regarding music with the hearing impaired and placed this research into the categories of musical perception, musical performance and music therapy. She suggested that there are several reasons for the small pool of research in this area (a) hearing impairment is a low incidence handicap and securing a suitable sized sample is difficult, (b) research frequently has to be conducted in a signed language, (c) there is a wide variety of degree and type of hearing loss in the population, and (d) variables such as type of amplification, educational history, age of onset, etc. are difficult to control (p. 72).

The deaf do indeed perceive musical stimuli. An excellent chapter by Boothroyd in the previously mentioned Robbins' curriculum details musical perception of the deaf in layman's terms while avoiding audiological jargon. Boothroyd explains that musical tones are more complex than the pure tones used in hearing tests due to the presence of harmonics. This allows many hearing impaired individuals to perceive the part of the tone that is in the individual's hearing range. While the complete harmonic series is not perceived, in many instances enough partials are present for a tone to be perceived. This chapter is an excellent resource for music educators finding themselves in the position of teaching music to the hearing impaired.

Ford conducted a study (1985) that indicated that deaf children do perceive the complex tones of music as Boothroyd indicated. She suggested that music education of the deaf child is dependent on the music teacher's awareness of the manner in which the deaf child receives and processes musical sounds. "The capacity to perceive and assimilate vibrations in 'music' resides in the brain, and although a hearing loss may impose limits on the extent to which musical potential is realized, a hearing disability does not negate the presence of innate musicality" (p. 2). Ford's findings have curricular implications for the music educator in 1) choosing music in the optimum register of b below middle c to a 12th above; 2) using large changes (intervals) of pitch for discrimination at first and then proceeding to smaller intervals; and 3) using concrete examples of pitch concepts.

Music educators, traditionally not trained in special education, are expected to meet the musical needs of hearing impaired children in the school and to provide instruction in an area for which no training exists. A 1991 survey (Darrow & Gfeller) indicated that many music educators are at a loss in trying to develop music programs for the deaf. The main obstructions were lack of appropriate curricula, professional training and lack of administrative support.

Sposato (1982) studied the possibility of utilizing existing components of curricula for hearing children within curricula for hearing impaired children. He concluded that existing designs do not provide valid frameworks for hearing impaired children because those who do the curricular planning do not obtain as much specific information on the deaf children as is needed. He suggested that until techniques are developed for maximizing the use of residual hearing on listening experiences in music, a curriculum would be of limited value.

Sanders' Hierarchy

Darrow (1989) suggested the use of Derek Sanders' hierarchy of auditory processing (1977) in developing sequential objectives for musical listening skills for all children regardless of their hearing status.

Because of the similarities between components of speech and music, the hierarchy is congruent with musical listening expectations. While this model was designed for the development of speech discrimination, it has important implications for music education and merits closer study.

The hierarchy consists of a 10 level sequence for processing auditory stimuli. The steps consist of awareness of the stimuli, localization, attention, discrimination between speech and non-speech sound, auditory discrimination, suprasegmental discrimination, segmental discrimination, auditory memory, auditory sequential memory and auditory synthesis. Use of this hierarchy for advancing listening experiences for hearing impaired children could be used to maximize the residual hearing on musical listening, as Sposato suggested. A brief look at each of these levels and the suggested correlation between the hierarchy and music follows. This examination is based on the work of Sanders (1977) in speech perception and Darrow (1989, 1990) in music therapy and music education.

Awareness of acoustic stimuli

Awareness of acoustic stimuli is the basic level of processing - the awareness or the absence of sound energy. The acoustic stimulus allows the auditory system to begin processing. This stimulus acts psychologically on the child in that he/she is now participating in the world. "Until a child is aware that a sound has occurred or has changed, he will not be motivated to search for it" (Sanders, 1977, p. 202). The obvious musical counterpart at this stage of the hierarchy is related to the child's awareness of music occurring in his/her environment. With respect to deaf children, it is crucial that the child become aware of the presence of music in the environment before any other musical listening and subsequent musical learning can proceed.

Localization

Localization refers to the correspondence of the sound stimulus to the object, event, or person causing (producing) it. This 'intersensory integration' of information is required so that a percept can be experienced auditorially. The movement is from concrete to abstract. With regard to music, this affects the child's ability to locate the source of the sound. This level of auditory experience requires the child to discover if the sound is coming from vocal, instrumental, live or recorded stimuli.

Attention

Attention is the ability of the individual to direct and sustain focus against a background of irrelevant stimuli. The child will need to attend to development of sound patterns for a specified amount of time against background activity or noise. One can not 'listen' without attending. Musical listening requires that the child attend to the music for a specified amount of time while also ignoring extraneous background activities.

Differentiation between speech and non-speech

The requirement for speech at this level is for the child to analyze auditory stimuli as belonging to a speech or non-speech model. Sanders maintained that auditory discrimination occurs after this stage is reached. The musical equivalent of this stage is the discrimination between sounds that are musical and sounds that are non-musical. This is another crucial step in the development of musical listening skills of deaf children.

Auditory Discrimination

This important area of auditory processing is concerned with the child's ability to distinguish between auditory patterns of differing lengths and complexities. Success in discrimination depends on the correct identification of the relationships in time, frequency and intensity components of sound. Some patterns are forced into the background while focus is maintained on certain patterns. This results in relationships such as focusing on the rhythm pattern while forcing the underlying pulse into the background, or focusing on the melody against the harmony. Other discrimination areas are concerned with differentiating among the timbres of different instruments and locating specific instruments within a total musical context.

Suprasegmental Discrimination

Suprasegmental discrimination is also known as the prosodic properties of speech. These properties convey specific information to the listener. This information comes in the form of intonation, contour, and expressive qualities of sound. The primary elements in speech are rate, stress, breath-grouping, pauses and speech rhythm (Darrow, 1984, pp. 49-50). The suprasegmental or prosodic qualities of music are the expressive qualities of tempo, dynamics, phrasing, intonation, and contour. The discrimination of these aspects in music would be called suprasegmental discrimination.

Segmental discrimination

This step in the hierarchy is concerned with analyzing varieties of patterns within a particular continuum. Examples of segmental discrimination in music include the discrimination of changes occurring in pitch within the continuum of melody and the discrimination of changes of duration within the continuum of rhythm.

Auditory Memory

The processing of 5-9 units of an acoustic event as on unit is referred to as chunking. It is necessary to retain a string of single sounds in the memory for this type of discrimination to occur. This progressive process includes the time necessary to process an acoustic event, hold it in storage, and integrate the event again. The musical equivalent of chunking can be described as remembering what instruments were heard in a composition. Recollection of melodic and rhythmic patterns from a composition also involves this type of auditory memory.

Auditory sequential memory

This step in the hierarchy involves the temporal and spatial relationships of patterns. The individual remembers the order in which acoustic stimuli and patterns are heard. The musical counterpart of this sequential memory would involve the child's recollection of the order in which instruments were heard or the arrangement of multiple sounds occurring in the harmony of a composition.

Auditory synthesis

In this last stage of the hierarchy, the auditory data is blended from bits into chunks and finally to identification of patterns that occur in the sound. Within the spectrum of music, auditory synthesis is involved with making critical judgments regarding form, texture and harmony.

Musical Applications of the Hierarchy

Darrow has suggested that Sanders' hierarchy can benefit music educators in developing musical listening in children (1989, 1990). For music educators of children with hearing impairments this model has great appeal. Because musical listening is essential for further music learning and because children with hearing deficits have such a difficult time in the area of music listening, this hierarchy can provide a sequential plan toward development of musical listening objectives. This could lead to musical experiences for hearing impaired children that could fit into existing music curricula for hearing children. Some practical suggestions for musical activities follow utilizing the previously described hierarchy of auditory processing.

Awareness

The music educator can play a variety of musical games built around the game of musical chairs. For example, the teacher can play beats on a resonant instrument while the children circle the chairs. When the instrument stops playing, the child must sit on a chair. At first, giving every child in the group a chair is a good idea to maintain focus on the sound rather than on which child is 'in' and which is 'out' of the game. As the children become more familiar with the game, the traditional rule of taking away a chair can be added. Another variation would be to have the child play the musical sound while having the rest of the class move to the musical sound.

The child can also indicate awareness of sound through a blindfold type of game. In this game all or part of the class could wear a blindfold and respond by raising hands or other such signal as to the presence of a musical sound. At first the sounds will have to be very obvious to the child; later the sounds can be more difficult.

Another useful activity is a variation on the 'freeze' game. In this activity a musical sound is played (via recording or live instrument) and the child responds with an appropriate movement, such as walking. When the sound is interrupted, the child 'freezes' into a position, resuming the movement when the musical sound reappears. To get the idea of the game across, it may be necessary for the class to do this as a group, with the teacher's realization that some children may be copying other classmates. However, once the children are comfortable with the game, the teacher should be able to do this sort of activity with individual children.

Localization

There are many traditional children's games that can be adapted to this step in the hierarchy. For instance, *Blind Man's Bluff, Mother May I* or *Tisket a Tasket* can use either vocal or instrumental sounds as the sound source to be located by the child. The child who is 'it' can be guided to play the game by moving according to the location of a particular musical stimuli.

A game built around the identification of finding an instrument is a fun way to work on location of sounds. A child can guess who among several of his/her classmates is playing an instrument hidden behind a partition such as an easel or large chart or even hidden under a table. Care must be taken to not give clues to the child through watching the arm or hand movements of his/her classmates. If the child guesses the location of the sound source correctly, he/she can take the instrument of his classmate and the classmate becomes 'it'.

Attention

Devising musical activities at this level requires a little more imagination on the part of the teacher. A good activity might be listening for a specific place in a short but complete piece of music that requires attention for more than a few seconds. A successful activity has been locating the 'surprise' in Haydn's *Surprise Symphony*. Having the children fall asleep as if they are at the court of Esterhazy and wake up at the surprise is an enjoyable activity for younger children. Listening for specific rhythmic and melodic patterns is another way to develop musical attention. For example, have the children listen for the rhythmic pattern in *Bingo* or *Teddy Bear* or other traditional folk songs, and respond with a movement or instrument. Another idea may be to listen for the motive in an excerpt from the 5th Symphony by Beethoven and have the children respond to it with hand movements showing the pitch levels of the melodic pattern as it occurs.

Speech vs. Non-Speech

Activities utilizing environmental, as opposed to musical sounds, are useful in developing this particular skill. Accompanying songs with found sounds, then repeating the accompaniment with classroom instruments can help get to achieve this awareness. Substituting non-singing vocal sounds used in chants or nursery rhymes as opposed to singing on a pitch can also aid in the development of this skill. Animal sounds in such folk songs as *Old MacDonald* and *Bought Me a Cat* can be replaced with pitches on melodic instruments to effectively illustrate this skill.

Auditory Discrimination

There are several ways to advance this ability in music. Following sound maps or call charts can help the hearing impaired child focus on specific instruments heard at a particular time against the larger sound of the orchestra. There are many examples of call charts in the music texts available from the large music textbook publishers.

Finding music that has a distinctive feature that stands out from the rest of the musical background is important. Focusing on the sounds of the temple blocks in *Sleigh Ride* or the sound of the alarm in *Syncopated Clock* can be used as discrimination activities. This idea could also be reversed to discriminate sounds which once were prominent in the music that are subsequently missing, such as the 'tick-tocks' that occur in the *Syncopated Clock* by Anderson.

Suprasegmental Discrimination

Identifying such aspects as tempo or dynamic changes can help to promote this aspect of music listening. Villa Lobos' *Circle Dance* is a good example of changing tempo. The children can readily show through movement the changes in the tempo. Hand jives can be added to songs that change tempo drastically. This is very enjoyable when added to music that was popular in the 1950's.

Parade by Ibert is a good example of music showing dynamic change. The children can respond to changes by marching and mimicking band instruments when they hear the loud sections. They can 'march away' when the dynamic level changes back to softer levels and fades away.

Segmental discrimination

Such activities as discriminating high/low or long/short are useful for development of this discrimination. The folk dance, *Seven Jumps*, is a fun way to reinforce the discrimination of long and short. The child walks to the beat until a long, sustained sound is heard. Different parts of the body are moved and held on these longer sounds. Walking resumes when the beat becomes steady again. This requires the child to discriminate long segments within the continuum of rhythm (beat).

Discrimination of segments within the continuum of melody can be accomplished through *Fanfare for the Common Man* by Copland. Following the upward intervals in the brass is a clear example of melodic pattern that is especially appropriate as these tones will most likely be more readily perceived by the hearing impaired.

Auditory memory

Creating sound stories is an interesting way for children to experience auditory memory. There are sound stories available in the music texts. Sometimes the stories that are the most fun are those that accompany books from the library or even stories from the children's basal reading series. Making decisions about which instrument might represent the ideas in a story and the order in which they are played is a good way to emphasize this skill. Assigning sound effects to the characters and movements in the story, *The Three Bears*, is an effective means to developing this memory.

Orchestral selections such as *Peter and the Wolf* by Prokofiev are another means to accomplish the development of auditory memory. Remembering which instrument stands for a particular character in the story and following the story based on the instrumental sound assigned to that character requires auditory memory.

Auditory Sequential Memory

Once again, sound stories are helpful in developing this skill. Cumulative songs also provide a good resource to use at this stage of auditory processing. Traditional folk songs like *Bought Me a Cat, Old McDonald, I Had a Little Overcoat* and *Hush Little Baby* are good songs to use with the hearing impaired. Visuals are helpful in the initial introduction of the song. However, since the goal of auditory sequencing is desired, the visuals should be taken away as soon as possible.

Melodic and rhythmic echo patterns are also effective activities to emphasize this sequencing skill. Presentation of canons in the Orff tradition can be used to good advantage to demonstrate sequential memory.

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Auditory synthesis

Manipulatives identifying the form structure of a piece of music can be used to advance this aspect of processing. For example, identifying the existence of the phrases in *Wild Horseman* by Schumann and then focusing on the similarities and differences of the phrases can enhance this stage of the hierarchy. The children can respond through movements and playing of instruments to illustrate the phrase structure. At a higher level, the *Children's Symphony* by McDonald can be played with the children responding to different sections by manipulating teacher made materials of pictures, shapes or letters.

Conclusion

While deaf children may require more attention from the music teacher and materials may have to be adapted in their presentation, musical perception is a possibility. "These children should have expanded opportunities that include a balanced music curriculum" (Ford, 1985, p. 91). Ford also maintains that hearing impaired children may be developmentally delayed as a result of a lack of exposure to musical stimuli. It would be logical, then, to assume that the first step in a music program for the deaf includes exposure to and understanding of musical sound. The sounds that hearing impaired children are able to hear through use of residual hearing and amplification need to be presented and explained in a systematic manner. Unfortunately, there are no easy 'how to' books or activities for the teaching of musical perception to the deaf. It is incumbent upon the music educator to seek out resources and adapt them wherever possible, or use them as starting points in the evolution of musical perception.

Derek Sanders' well developed and systematic hierarchy for auditory processing with regard to speech perception is a viable resource to aid in development of musical perception in deaf children. His hierarchy has received attention by other music educators (Darrow, 1989, 1990) who feel that it has implications for the development of musical listening skills in all children regardless of their peripheral hearing system.

With a little imagination and the adaptation of materials used in the musical education of hearing children, activities for the deaf can be designed to enhance the development of the perceptive skills in Sanders' hierarchy. To build an effective music program with the deaf, it is necessary to build a foundation of musical perception in the early years of the child's music education. By constructing activities with advancement of this perception in mind, music education of the deaf can be facilitated. This could greatly aid the music educator in choosing appropriate musical activities and materials for these children and may alleviate the music educator's feelings of frustration and inadequacy.

References

Darrow, A. A. (1984). A comparison of rhythmic responsiveness in normal and hearing impaired children and an investigation of the relationship of rhythmic responsiveness to the suprasegmental aspects of speech. Journal of Music Therapy, 21(2), 48-66.

Darrow, A. A. (1989). Music therapy in the treatment of the hearing impaired. Music Therapy Perspectives, 6, 61-70.

Darrow, A. A. (1990). Music and the hearing impaired: A review of the research with implications for music educators. Update.

Darrow, A. A. & Gfeller, K. (1991). A study of public school music programs mainstreaming hearing impaired students. Journal of Music Therapy, 28(1), 23-39.

Darrow, A. A. & Heller, G. N. (1985). William Wolcott Turner and David Ely Bartlett: Early advocates of music education for the hearing impaired. Journal of Research in Education, 33, 269-279.

Edwards, E. (1974). Music Education for the Deaf. Maine: Merriam-Eddy Co.

Ford, T. A. (1985). The effect of musical experiences and age on the ability of deaf children to discriminate pitch of complex tones. (Doctoral dissertation, University of North Carolina at Greensboro).

Gfeller, D., Darrow, A. A. & Hedden, S. K. (1990). On the ten-year anniversary of P. L. 94-142: The perceived status of mainstreaming among music educators in the states of Iowa and Kansas. Journal of Research in Music Education, 38, 90-101.

Lewis, A. G. (1983). Listen, Look and Sing. Morristown, NJ: Silver Burdett & Ginn.

Robbins, C. & Robbins, C. (1980). Music of the Hearing Impaired and Other Special Groups: A Resource Manual and Curriculum Guide. St Louis, MO: Magnamusic-Baton.

Sanders, D. A. (1977). Auditory perception of speech: An introduction to principles and problems. NJ: Prentice-Hall.

Schatz, V. W. (1989). Framing the music/rhythm curriculum in a scope and sequence model. In A. A. Darrow (Ed.), Proceedings from the Second National Conference on Music and the Hearing Impaired, (81-84).

Silver Burdett (1991). World of Music. Morristown, NJ: Silver Burdett & Ginn.

Sposato, M. (1982). Implications of maximal exploitation of residual hearing on curriculum planning music education for hearing impaired children. (Doctoral dissertation for State University of New York at Buffalo).

Staton, B. & Staton, M. (1991). Music and You NY: MacMillan Publishing Co.

Appendix

Resources for Musical Examples

Example	Source	Hierarchy
A Tisket Tasket	SB 1	Localization
Mother May I	Trad. game	Localization
Blind Man's Bluff	Trad. game	Localization
Surprise Symphony (Haydn)	MAC 1, 6	Attention
Bingo	MAC 2	Attention
Teddy Bear	MAC K, 1	Attention
5th symphony (Beethoven)	MAC 6	Attention
Old MacDonald	MAC K, 1	Speech/Non Speech
I Bought Me a Cat	SB K	Speech/Non Speech
Sleigh Ride (Anderson)	MAC 2	Auditory Discrimination
Syncopated Clock (Anderson)	SB 4	Auditory Discrimination
Sound maps	MAC, SB 1-5	Aud. Discrimination

Example	Source	Hierarchy
Circle Dance (Villa-Lobos)	LLS 1	Suprasegmental Discrimination
Parade (Ibert)	MAC 2	Suprasegmental
Seven Jumps	Danish Folk Dance	Segmental
Fanfare for Common Man (Copland)	SB 8	Discrimination
Sound Stories	AC, SB K	Auditory Memory
Three Bears	Trad. story	Auditory Memory
Peter & Wolf	MAC	Auditory Memory
Cumulative songs	MAC, SB K-5	Sequential Memory
Hush Little Baby	MAC K, 1	Sequential Memory
Wild Horseman (Schumann)	MAC K, LLS 1	Auditory Synthesis
Children's Symphony (MacDonald)	MAC K, 2	Auditory Synthesis

LLS= Listen, Look & Sing
MAC= Music & You, MacMillan
SB= World of Music, Silver Burdett & Ginn